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ITE PROJECT 131

Interim Report to Nature Conservancy Council

DEMOGRAPHIC EFFECTS OF NEST PREDATION ON GOLDEN PLOVERS  
AND OTHER WADERS

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## 1 INTRODUCTION

During recent studies of golden plover (Pluvialis apricaria) at Kerloch in Kincardineshire, the population declined from 111 birds in 1977 (Parr 1980) to only 12 in 1985. This coincided with the ending of red grouse research there in 1978, and afforestation of parts of the area in 1981. Since 1978 carrion crows (Corvus corone) and common gulls (Larus canus) have increased, and a higher proportion of golden plover, and other waders, have failed to rear any young.

This project, which began in March 1986, aims to test experimentally the hypotheses that a) nest robbing by crows and gulls causes poor breeding success in golden plover, b) the density of golden plover in subsequent years is related to their breeding in earlier years, and c) other moorland waders are similarly affected.

## 2 METHODS

Parr (1980) describes methods for recording the breeding density and breeding success of golden plover. The same methods were used for lapwing (Vanellus vanellus), curlew (Numenius arquata), redshank (Tringa totanus), oystercatcher (Haematopus ostralegus) and snipe (Gallinago gallinago) at Kerloch (experimental area) and Corgarff in Aberdeenshire (control area). At Kerloch, crow and gull numbers were kept down by destroying their nests and killing the birds using poisoned eggs placed in artificial nests. On all visits to each area the presence or absence of crows and gulls was recorded, and their numbers noted.

### 3 RESULTS

#### **Waders**

There were equal numbers of golden plover on both areas (Table 1). The experimental area had more lapwing, curlew and oystercatcher, and no redshank or snipe were seen on the control area. The percentage of pairs that hatched young was low at Kerloch and high at Corgarff (Table 1).

#### **Poisoned eggs**

All eggs from the first batch of 50 artificial nests disappeared within 2 weeks. At least half were eaten by crows and gulls, and the remainder disappeared without trace. These were probably taken by foxes, as were 19 from the second batch of 30, the rest remaining untouched.

#### **Egg predators**

Prior to putting out poisoned eggs (bait), crows were seen twice as frequently as common gulls (Table 2). The ratio was the same after baiting although both species were seen less often, and there were fewer of them (Table 2). In the 2 weeks following baiting, the number of crows and gulls seen dropped to zero, and then gradually built up again. Within 7 weeks at least 2 new pairs of crows had established territories on the moor. Only 4 crows and 10 gulls were picked up dead, and the rest disappeared without trace. There were no crows and only 2 gulls on the control area.

Foxes were not killed at Kerloch and approximately 1 fox per hour was seen during counts within the afforested area there. A gamekeeper killed foxes at Corgarff where none was seen during counts.

#### 4 DISCUSSION

Most crows and gulls on the experimental area were successfully removed by poisoning and I found no evidence of nest predation by these birds. In spite of this no golden plover and few other waders hatched any young, whereas almost all breeding waders on the control area reared young.

One important difference between the areas was that more foxes were seen near the experimental than the control area. Evidence from the disappearance of poisoned eggs suggests that nest robbing due to crows and gulls in previous years was, in their absence, now due to foxes. Similar compensatory nest predation by stoats (Mustela erminea) on willow ptarmigan (Lagopus lagopus) and black grouse (Tetrao tetrix) was seen in Norway by Parker (1984). This is an interesting, though unexpected, result. In future, fox scats and other signs of foxes will be recorded systematically to obtain a measure of fox activity on experimental and control areas.

It would be worth repeating this experiment where there are no foxes e.g. on an island, to test if, in the absence of foxes, the removal of crows and gulls results in better breeding success in waders.

## 5 ACKNOWLEDGEMENTS

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## 6 REFERENCES

- PARKER, H. 1984. Effect of corvid removal on reproduction of willow ptarmigan and black grouse. J. Wildl. Manage. 48, 1197-1205.
- PARR, R. 1980. Population study of golden plover Pluvialis apricaria, using marked birds. Ornis Scand., 11, 179-189.

Table 1. The number of breeding waders and the percentage with young on experimental and control areas.

Species	Experimental area		Control area	
	No. of breeding pairs	percentage with young	No. of breeding pairs	percentage with young
Golden plover	6	0	6	100
Lapwing	14	43	9	100
Curlew	15	27	7	86
Oystercatcher	11	0	7	100
Redshank	5	0	0	-
Snipe	5	20	0	-

Table 2. Total numbers and percentage of visits when crows and common gulls were seen on experimental and control areas.

Species	Experimental area		Control area	
	total seen	percentage of visits	total seen	percentage of visits
Crows	*16	*100	0	0
	+5	+63		
Gulls	*38	*50	2	25
	+6	+32		

\* Before poisoned eggs put out

+ After poisoned eggs put out

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